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# Facilitating practice-led co-innovation for the improvement of animal welfare

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## **Abstract:**

Using the egg-laying-hen sector as a case study, the EU-funded 'Hennovation' thematic network has been testing mechanisms to enable practice-led innovation through the establishment of 19 innovation networks of farmers and within the laying-hen processing industry, supported by existing science and market-driven actors. These networks were facilitated to proactively search for, share and use new ideas to improve hen welfare, efficiency and sustainability.

This paper provide insight in the facilitation process and tools used, including a framework for the facilitation of practice-led collaborative innovation processes. This framework was developed through participatory action research to monitor network performance and self-reflection by facilitators. Practice-led innovation processes are network specific and evolve as the actors within the network come together to share common problems, experiment with possible solutions and learn. The participatory and iterative nature of this process leads to uncertainty in process and end-results. This raises methodological challenges in the management of such processes and requires a flexible and adaptive management approach focusing on learning and reflection.

## Introduction

There is a growing policy **interest** in agricultural innovation generated through practice-led collaborative learning processes. The EU H2020 research strategy, for example, is currently promoting a multi-actor interactive approach to innovation that includes a high level of farmer engagement (SCAR, 2013). For many years, the assumption in animal health and welfare policy has been that scientists working in institutions and large enterprises are best placed to provide the technical solutions to policy challenges. However, despite considerable attention, there remains a significant gap between applied science and farm practice (Pretty, 1995). Recent years, have seen a growing realization that, to deal with the current challenges in agriculture, there is a need to go beyond linear models of knowledge transfer to more systemic forms or processes of knowledge co-generation focusing on multiple actors (World Bank, 2006; Conroy *et al.*, 2008). These innovation processes go beyond technology development and transfer to farmers, to instead see innovation as a process to build capacity and create change at the farm and institutional levels in order to increase productivity and sustainability (Darnhofer *et al.*, 2008; Röling, 2009).

Akrich *et al.* (2002) argue *“the evaluation of the disadvantages and advantages of an innovation is entirely in the hands of the users: it depends on their expectations, their interests, on the problems which they raise”*; in short, their practice. Practice-led innovation responds to the demand for innovation to solve local problems using practical knowledge and creativity at the farm level (Vogl *et al.*, 2016). Although practical local knowledge is an essential foundation for local innovation, this alone is rarely enough to generate it (Eastwood *et al.*, 2017; Arkesteijn *et al.*, 2015; Lambrecht *et al.*, 2015). To enable this process requires creating space for joint learning and knowledge sharing through innovation networks which bring-together different actors, with different (forms or sources of) knowledge (Spielman and Birner, 2008; Moschitz *et al.*, 2015; McKenzie, 2013). Innovation networks can include a wide range of individuals and organizations (e.g. producers, scientists, advisory services, consumers, SME's, NGO's and local policy makers) and research shows innovation networks are dynamic in nature (their composition can change over time as priorities and access to resources of actors change), vary in shape and size, and in the strength of their relationships between actors (Moschitz *et al.*, 2015; Brunori *et al.*, 2013).

The role of a network facilitator is essential to bring actors together (network brokering) and to stimulate joint learning (Wielinga and Herens, 2013; Klerkx and Nettle, 2013). This role is different from more

traditional advisory roles of knowledge transfer and involves the mobilization of networks, guiding the network through the innovation process and promoting learning and linking with support actors (Klerkx *et al.*, 2012; Röling, 2009). These facilitator roles in innovation have been widely described in literature (Klerkx and Jansen, 2010; Howells, 2006; Moschitz *et al.*, 2015; Kilelu *et al.*, 2013; Klerkx and Gildemacher, 2012). However much less is written on how to support the facilitator in these roles. Klerkx and Gildemacher (2012) indicate that facilitators may use a number of methods, tools and monitoring approaches (such as the Free Actors in Networks approach developed by Wielinga *et al.*, (2008) and the Reflexive Monitoring in Action developed by Van Mierlo *et al.*, ((2010b)). Yet facilitating innovation necessitates a high degree of 'learning by doing'.

Practice-led innovation processes evolve as the actors within the innovation network come together to share common problems, experiment with possible solutions and learn. The process is influenced by a variety of factors such as the institutional context, policy environment, current market forces and wider Agricultural Innovation Systems in a specific country (Klerkx *et al.*, 2010; Klerkx *et al.*, 2017). The participatory and iterative nature of this process, its collective outcome and the influence of external factors, leads to uncertainty in process and end-results (Klerkx *et al.*, 2012; van Mierlo *et al.*, 2010a). This raises methodological challenges in the management of such processes and requires a flexible and adaptive management approach focusing on learning and reflection (Wielinga and Vrolijk, 2009; Arkesteijn *et al.*, 2015; van Mierlo *et al.*, 2010a).

This paper describes the process of facilitating practice-led innovation through innovation networks as part of the Hennovation project. It aims to provide insight in the facilitation process and tools used, including a framework for the facilitation of practice-led collaborative innovation processes. It outlines how the Hennovation project has uses a participatory research methodology to explore mechanisms to facilitate and stimulate practice-led innovation. And the paper ends with the discussion of the lessons learned after 18 months co-innovation by the Hennovation networks.

### **Practice-led innovation in egg-laying hen sector**

Using the egg-laying-hen sector as a case study, the EU-funded 'Hennovation' thematic network has been testing mechanisms to enable practice-led innovation through the establishment of innovation networks of farmers and within the laying hen processing industry, supported by existing science and market-driven actors. These networks were facilitated to proactively search for, share and use new ideas

to improve hen welfare, efficiency and sustainability. The consortium consisted of six consortium partners, five academic institutes and one agriculture advisory service in five European countries. In total 19 multi-actor networks were mobilised on local and regional levels across the Czech-Republic, The Netherlands, Spain, Sweden, and the United Kingdom. The networks worked specifically on two particular areas of concern: feather (or injurious) pecking on-farm and the transport and use of end-of-lay hens. 15 networks focused on finding practical solutions to problems related to feather (or injurious) pecking on-farm. Beak trimming is the commonest measure used to reduce feather pecking in laying hens however there is a clear move in many member states towards more widespread prohibition of the practice (EU wide beak trimming ban), which is regarded as an ethically undesirable mutilation. This creates strong demands from the poultry industry for practical and effective measures to reduce feather pecking without resorting to beak-trimming. Four further networks focused on practice-led innovation in the problematic and largely unsustainable, after-use of end-of lay hens.

The project team avoided pre-defining the term 'network' to allow for various routes to network formation (Kanter, 2000). Several networks were formed from larger pre-existing producers groups connected to a specific egg packing company or veterinary practice or simply through friendship. Others were generated from farmer interest or, as in the case of the end-of-lay groups, were brought together by the project. The network size of the on-farm networks varied from three to 25 producers and were variably supported by scientists, veterinarians, advisors, feed companies and so on according to the specific topic addressed by the network. The laying-hen production systems included organic, free range, barn (aviary) or (furnished) cage systems and mixed systems. Network meetings were almost always face to face though some use telephone meetings in order to overcome the organisational issues that arose with a geographically dispersed network.

## **Hennovation Project Methodology**

The Hennovation project adapted a participatory action research approach to explore and test mechanisms to facilitate and enhance practice-led innovation. The research methodology, based on Moschitz *et al.* (2015), includes two interlinked learning spaces; a reflection and action process at the facilitators (project) level and a co-learning process at the network level, Figure1. At the facilitators' level, the facilitators (who were also project researchers) were supported to develop and implement the approach and reflect on its use through workshops, skype meetings and the use of an online peer

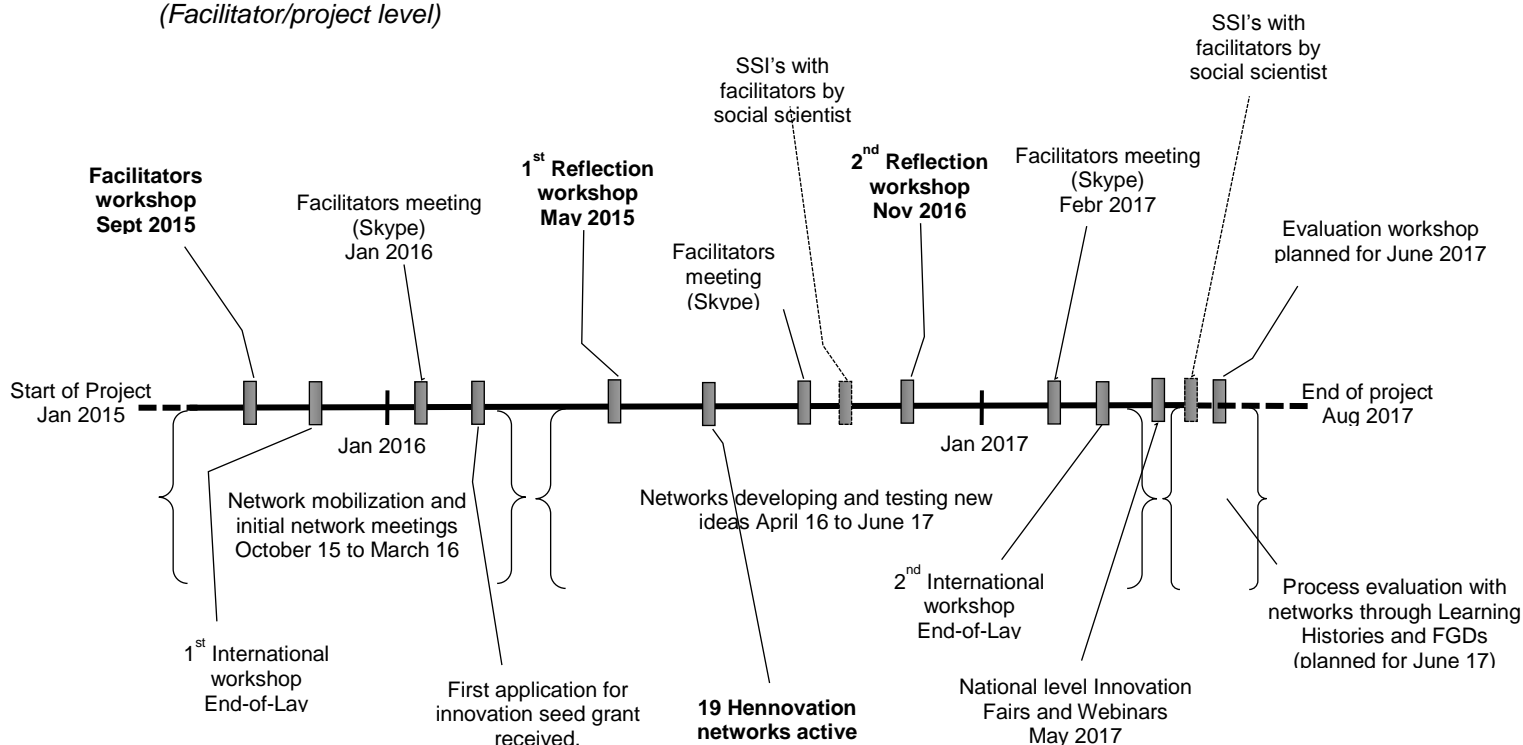
discussion platform (wiki). At the same time, the innovation networks were working together with the facilitators, pursuing an innovation-generating process to develop innovative solutions for their problems faced.

A facilitators' coordinator supported the facilitators and acted as 'reflexive monitor', probing the way the facilitators work and their underlying assumptions through reflection workshops (Van Mierlo *et al.*, 2010b; Botha *et al.*, 2014). Data on network performance and facilitators' reflection was systematically collected using a project wiki. Social scientists involved in the project observed the process, analysed the data and conducted interviews to provide further insight in the effectiveness of approach.

Three workshops have been carried out, an initial 'Facilitators Workshop' and two 'Reflection Workshops'. The focus of the Facilitators Workshop was to conceptualise innovation in the context of practice-led innovation, to identify the process by which innovation might occur and their role as network facilitators. A framework for the adaptive management and facilitation of practice-driven innovation was developed by and with facilitators. The two Reflection Workshops focused on sharing progress and experiences, (self) reflection on the innovation process (use of the framework) and its outcomes, and discussing potential challenges. Tools such as network mapping, Venn diagram for stakeholder analysis and the learning history (Kleiner and Roth, 1996; Wielinga and Geerling-Eiff, 2009) were used to monitor network performance and self-reflection by facilitators, with the idea that the facilitators could also use these tools for self-reflection with their networks.

Figure 1 Timeline of the Hennovation project outlining important events in two learning spaces.

**Learning space 1 Facilitator reflection & action process**  
(Facilitator/project level)



**Learning space 2 Network co-learning process**  
(Network level)

**Hennovation Network Facilitators**

In total 11 facilitators from the five participating countries were recruited to support the innovation networks. All the recruited facilitators had university degrees in animal health and welfare or veterinary sciences. All had experience working in the livestock sector and some had experience working in the laying-hen sector. The facilitators had a varying degree of experience in collaborative research projects, some had little or no previous experience whilst some had facilitated more collaborative research processes, though not necessarily focusing on innovation by farmers.

Through a workshop exercise a facilitator's 'job description' was collaboratively developed by facilitators themselves. The facilitator's role was summarised as comprising of a range of dynamic and situated functions leading towards the recruitment of existing (or the establishment of new) networks, to supporting their progress towards practice-driven innovation, developing connections and linking networks with actors who have similar interests as the network, and, finally, monitoring and reflecting on the functioning of the network to determine support and action, including self-evaluation and learning

by the facilitator. Reporting on network meetings and network performance (on the wiki) and sharing experiences with other facilitators through discussion forum and planned workshops was also an essential part of the facilitators' role. The uncertainties in process and outcome were initially quite daunting for those embarking on facilitating innovation processes for the first time. Over the course of the action learning process the confidence of the facilitators increased. This became evident through the learning history exercise (after Wielinga, 2012) conducted after the first six months, Figure 2.

*Figure 2 Hennovation Network facilitators Learning History September 2015 to May 2016*

*The facilitators were asked to reflect individually on the previous six months and write on sticky notes, positive, negative and light bulb moments. On a large piece of paper a timeline of six months was drawn and the piece of paper was divided in three sections from left to right. Each facilitator was requested to stick their notes at the appropriate place on the timeline and in plenary the sticky notes were read aloud and analysed. After the initial analysis the facilitators were asked to identify the most important events/periods in scenes. Each scene was provided with a heading representing the content of the scene, see below.*



### **Framework for facilitators' reflection and action**

Facilitating a dynamic, practice-driven innovation process is at the heart of the Hennovation project. Key to this have been the Facilitators Workshops, the first of which sought to identify the process by which innovation might occur in practice-driven innovation networks, taking into account that the nature of individual innovation processes as this is also partly contingent upon the networks themselves. Through a series of workshop exercises, the facilitators charted the distinct stages, or 'process steps' towards innovation. These were subsequently used to frame the ways in which facilitators understand and evaluate the development of innovation, and the functioning of their networks and was further developed into a framework for reflection and action.

Initially the facilitators identified six key steps in the innovation process:

1. The identification of the need for innovation; shared problem/opportunity,
2. The generation (and assessment) of innovative ideas which could provide potential solutions,



3. The selection of an innovative idea and plan action to 'test' the idea including resources required in terms of time, technical support and monetary,
4. The practical 'testing' / development of the idea on-farm, during transport or at the slaughter house,
5. The implementation and upscaling of the innovation in practice,
6. Finally, the wider dissemination of the innovation amongst the sector.

Further discussion of each step led to the development of guiding questions to encourage facilitators to reflect on the functioning of their networks, the assessment of 'network health' (Wielinga *et al.*, 2008), the form of their intervention (action), and the nature of any intervention deemed necessary to move the innovation process forward, Table 1. In addition to individual reflection by each network facilitator, participants were also asked to compare the progress and functioning of each network and identify why similarities or differences (including differences across different countries) in performance emerged.

The framework presented in Table 1 was developed as a tool to guide the facilitation of the innovation process and to stimulate facilitator learning in managing the process in the field. It was not intended to be a comprehensive set of criteria to evaluate network performance. It is worth noting that although the framework is presented stepwise, the innovation process is rarely linear and the time allocated for each step cannot be predicted (Klerkx and Gildemacher, 2012). Moreover, it depended, amongst other things, on a variety of other factors such as network capacity and the nature of the intended innovation itself. The challenge in the development of the framework was that on the one hand it needed to provide enough structure to be useful for the facilitator whilst on the other hand it needed to be generic and flexible enough to accommodate the diversity and unpredictability of the process (Klerkx and Gildemacher, 2012).

Table 1 Framework to support facilitation of practice-led innovation processes (based on Facilitators Workshop exercises and adapted from ENRD (2013))

<b>Step 1 Innovation identification</b>	
1.1	Level of clarity of purpose and shared objective as a network.
1.2	Level of agreement on network function, e.g. decision making, common rules, reaching consensus.
1.3	Problem identified based on shared need. (Is there a clear common problem?)
1.4	Market or other actors value the problem (relevance?).
1.5	Capacity of network to find practical solutions to the problem identified (as perceived by the facilitator).
<b>Step 2 Generation of innovative ideas</b>	
2.1	Level of which the idea/solution is shared amongst the network.
2.2	Feasibility of the idea (including estimate of financial viability).
2.3	Level of diversity of knowledge used by the network: science, advisors' input, practical experience.
2.4	Capacity of network to test the practical solutions selected (as perceived by the facilitator).
<b>Step 3 Action planning &amp; resource mobilization</b>	
3.1	Robustness of the action plan including timeframe and task division (Everyone knows what is happening, when and by whom?)
3.2	Level of clarity on anticipated result and system/criteria in place for monitoring and/or measuring results.
3.3	Level of resources members within the network commit towards development/testing.
<b>Step 4 Practical development/testing</b>	
4.1	Level and rate of innovation. (Does the action plan leads to action?)
4.2	Willingness of members to discussed and shared within the network and learn from successes and failures.
<b>Step 5 Implementation and upscaling</b>	
5.1	Level of satisfaction of members with regard to relevance and affordability of solutions developed.
5.2	Number of network members applying the innovation as common practice.
5.3	Network members' pride of what they achieved. (Are they wanting to share the idea with others)?

## **Lessons learned from facilitating practice-led innovation in the laying hen sector.**

Drawing on the reflections emerging from the workshops, facilitators meetings and the use of the framework presented above in the field, we offer here a series of insights and lessons learnt.

### *Formation of networks*

In many countries the networks were formed from bigger existing groups connected to a specific egg-packing company, veterinary practice, or farm assurance scheme. Facilitators' reflection on network mobilization during the first reflection workshop in May 2016, revealed that the use of such key contacts (intermediates) was perceived as pivotal in enabling network formation. Facilitators succeeded in forming networks through persistent engagement with these key contacts. However subsequent involvement of these key intermediates in the innovation process could be positive and constructive or,

on occasion negative, where they tried to impose their own agenda on the process. The formation of networks took much longer than expected. Initially three months was planned to form two to four networks in each project country however this actually took over six months and facilitators who were relatively new to the sector found it particularly challenging and time consuming. Several forms of network formation emerged which potential implications for the subsequent functioning of the network. Whilst pre-existing relationships between network members are held to equate with higher levels of trust, Kanter (2000) indicates that increased network density does not necessarily leads to more innovation and could actually constrain the amount of knowledge available within the network. Although network formation took longer with previously unrelated members, reflection showed that there was no clear indication that the subsequent steps in the innovation process took more time or were more or less effective. Relationships were also shaped by the kind of contract that producers had, and whether these fosters collaboration or competition. For countries such as the Czech Republic and Spain with highly integrated supply chains in the laying-hen sector the formation of the network was unusual and perceived as innovative by the network members.

#### *Understanding and expectations of the practice-led innovation approach.*

Differential understanding of what innovation is and how it is framed also gave rise to differences in network processes and outcomes. Individual understandings of innovation are unlikely to be uniform, with network members as well as support actors bringing pre-conceived ideas of innovation to the network. The ways in which networks frame innovation translates to the actions of the network. The challenge for facilitators was to ensure a clear articulation of the concept of practice-led innovation as something which producers have the capacity to generate and realise. The process of practice-led innovation in which the practitioners are empowered to develop their own solutions was not always valued equally (legitimacy). At the network level some members were sceptical of the approach and were expecting or were more motivated to learn from “experts” via passive knowledge acquisition rather than generating new knowledge. This brought challenges for the facilitator in overcoming a culture of receiving, rather than generating knowledge.

#### *Transition from gathering knowledge to generation of new knowledge*

A particular challenge for many facilitators was recognising the point at which a network had sufficient new or adaptive knowledge and/or understanding to progress into action. Several Hennovation networks found it difficult to progress beyond idea generation, Table 1 step 2, and gathering knowledge on many

areas to focus on a single targeted idea to develop and test. Other found it difficult to progress into action after having selected a particular idea and thus returned to gather further knowledge on a new topic, Table 1 step 1. This impasse presents a particular challenge for facilitation. For facilitators, the challenge was, first, to recognise whether new information/knowledge is required by the network to begin to address the issue and innovate and, second, to appreciate when it is right to encourage the network to focus on a particular area and plan to trial or test something new. The difficulty that networks experience in the progression from information gathering to action planning may not only be one of a balance of different types of knowledge (e.g. science and practice) but may also lie in issues of network and facilitator confidence, in the nature and coherence of the problem addressed, and in the tangibility and achievability of the intended innovation.

#### *Different types of innovations*

Over a period of 18 months, Hennovation networks have tackled a range of technical challenges through the development of different types of innovations. Alongside technical or 'hard' innovations (e.g. new type of litter material to reduce stress and encourage natural behaviour or the use of alpacas in organic systems to reduce predation), a variety of often less expected and sometimes unintended 'soft' innovations also emerged through these network (e.g. a new way of marketing low valued hen meat and new relationships between production chain actors, for example the pullet rearers). This process leads to innovation on both individual as well as collective network level. Some ideas developed and tested were innovative in a specific farm context (for example the use of different range covers, sheds, cover crop and trees to encourage birds out onto the range) though not necessarily innovative for the laying-hen sector as a whole. Others had a potential to have a great impact on in the sector (for example the use of trolleys when catching hens and immediately placing them into drawers in which they are transported to the processing plant).

#### *Facilitators' role and support needs*

Overall there is a large diversity in capacity and functioning of the innovation networks, both within and between countries. This provides a great opportunity as well as a great challenge for the facilitators learning to manage the innovation process. The role of the facilitator is structured by the context in which the network operates. Facilitator confidence, experience, and personality all impact on the ways in which networks are facilitated, how any challenges are approached and resolved and, ultimately upon the eventual outcome of the network. The role of the facilitators was not static and varied between networks

and process steps. During a reflection exercise at the workshop in November 2016 the facilitators reflected on the personal attributes required to facilitate the innovation network. The facilitators identified many similar attributes despite large diversity in context, personality and experience. The key attributes identified were: flexible, adaptive, patient, observant, focused, committed/dedicated, determined, resilient, energetic, sociable, open-minded, resourceful and cooperative.

Reflection on the support needs of the facilitator during the reflection workshop identified the following:

- Access to a support actors (scientist, advisors and others) to link the right actors to the network
- Tools to facilitate the network process to reach the best possible outcome.
- Opportunities to share knowledge and experience between facilitators
- Group facilitation training to feel confident in dealing with challenging individuals in the networks
- Administrative and logistical support

## **Concluding comments**

The Hennovation project demonstrates:

- Networks are a good mechanism for generating innovation (or a certain kind of innovation) at the 'on-the-ground' level of farming practice.
- Network facilitation takes many forms but is critical in creating the capacity for achieving innovation, or moving towards innovation within networks
- The kinds of innovation generated through practice-led networks are different from the kinds of innovation emerging from science and more traditional top-down pathways of innovation delivery but can be equally valid in practice.

By focusing on the dynamics of practice-driven, grass root innovation and its articulation with existing science and market-driven actors, this project has explored the conditions necessary for a significant and lasting shift in the enabling mechanisms and procedures for practice-driven innovation both in impacting upon science-driven innovation and in delivering practical solutions within the animal production industry.

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